sufficient to justify the costs associated with system upgrades and would not

discourage operators from investing in newer technologies to improve services to

customers.

Whether the Commission permits pass-throughs or expedited cost showings for

system upgrade costs, the regulatory authority should evaluate only the justification

for costs of investments in improved equipment or system upgrades and not whether

the expansion itself is justified. The decision to improve equipment and services is a

business judgment best left to the cable operator.

VII. THE COMMISSION SHOULD ADOPT MEASURES TO SIMPLIFY RATE REGULATION OF EQUIPMENT CHARGES.

The Commission suggests that a cost-based approach to equipment cost

showings could be based on average costs of various types of equipment.[91]

Comcast supports this proposal. However, this should not preclude the regulatory

authority that evaluates a cost showing from considering factors in addition to the cost

of equipment in determining whether proposed equipment rates are unreasonable.

Each type of equipment should be evaluated based on factors unique to the operator.

---

[91]   NPRM at ¶ 79.

A. The Commission Should Treat Equipment Differently for Different Operators Based on Individual Circumstances.

The Commission suggests that several factors, such as the region in which a system is located, may be used to group operators into different categories for purposes of analyzing equipment costs in cost-of-service showings. Id. Though the Report and Order adopts a cost-based scheme for treatment of equipment costs under the benchmark methodology, the Commission must adopt a more flexible standard for treatment of equipment in the unusual circumstances which require operators to justify rates via a cost showing. One such circumstance involves the special conditions under which newer systems adopt rates for service and equipment. The age of a system should be considered in treating equipment costs. Systems that have had to undergo rebuilds or upgrades of outdated equipment should receive similar treatment.

B. Promotional Equipment-Related Network Costs Should Be Recoverable.

The Commission's rules do not permit recovery of promotional costs in prices charged for installations and equipment that is offered at below cost; the Commission instead requires below cost offerings to be limited in relation to an operator's overall equipment basket.[92] If the Commission does not reconsider this decision under the benchmark methodology, it should permit operator's to justify costs related to promotional offerings in abbreviated proceedings. Because the Commission

---

[92] Report and Order at ¶ 301.

acknowledges that promotional offerings are in the public interest, it should permit operators to justify related costs. These costs would best be allocated to the equipment basket and recovered through equipment charges.

VIII. LONG TERM ISSUES MUST BE DEALT WITH SEPARATELY FROM THE INITIAL PHASE OF THIS PROCEEDING.

The Commission seeks comment on a number of questions relating to the accounting practices of cable operators, including whether it should mandate a uniform system of accounts and prescribe depreciation rates for the assets of cable systems. While the Commission must ultimately resolve all the questions posed in the NPRM, the resolution of certain long term issues can be put off until a future date without adverse consequences to consumers or cable operators. Comcast submits that the Commission should defer consideration of questions relating to the accounting practices of operators to a second phase of this proceeding.

The majority of cable systems follow Generally Accepted Accounting Principles ("GAAP"). Books kept in accord with GAAP are sufficient to allow the Commission and local franchising authorities to monitor the accounting practices of cable operators. While GAAP does not require the level of detail and uniformity found in the records of most traditional regulated utilities, achieving this level of detail and uniformity in the cable industry will require a significant effort. Comcast believes that the time and effort of the Commission would be better spent dealing with the more immediate regulatory concerns addressed in these Comments.

IX. CONCLUSION.

Comcast submits that the Commission's tentative identification of traditional rate-of-return regulation as the appropriate method for cable cost-of-service showings is misguided. Cable simply does not fit the traditional public utility paradigm, and application of such a regime would be draconian. If the Commission moves forward with ratebase regulation, however, it must adopt a ratemaking methodology that allows cable operators to recover their net investments and earn a return on their tangible and intangible assets. Comcast proposes a Z factor as a method to recover these investments over an appropriate recovery period.

The cable industry is so diverse that application of a unitary rate of return would be a windfall for some operators and disastrous for other operators that are at a different stage of their internal business cycles. Moreover, the Commission has previously recognized the difficulty and inherent arbitrary nature of selecting a unitary rate of return.
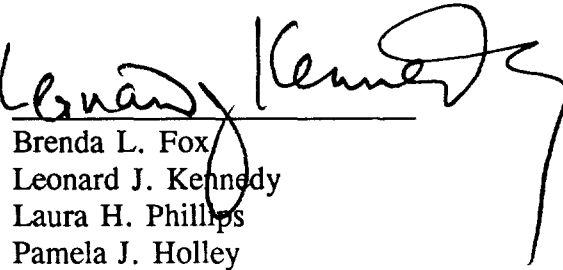
Consequently, Comcast proposes the adoption of streamlining methods that permit cable operators to demonstrate that existing rates are reasonable. Certain predictable system changes, such as system upgrades and increases in channel capacity should not cause a cable operator to go through repeated cost-of-service showings to justify rates.

Finally, the Commission should defer long-term issues of depreciation and uniform accounting rules to a later phase of this proceeding in order to concentrate on the critical short-term initial cost justification issues.

Respectfully submitted,

COMCAST CABLE COMMUNICATIONS, INC.

By: _____

Brenda L. Fox
Leonard J. Kennedy
Laura H. Phillips
Pamela J. Holley

Its Attorneys

DOW, LOHNES & ALBERTSON
1255 Twenty-Third Street, N.W.
Suite 500
Washington, D.C. 20037
(202) 857-2500

August 25, 1993

Rate of Return
Recommendations
for the
U.S. Cable Television Industry

Prepared for:

Comcast Corporation

Prepared by:

AUS Consultants
George R. Schink
Frank J. Hanley

August 25, 1993

Rate Of Return Recommendations

Introduction

The Commission recommends establishing a single rate of return for all cable operators to be used for the "purpose of setting rates based on a cost of service showing" (NPRM at ¶46). Clearly, the average cost of capital (i.e., the return required in the financial markets) for all cable companies could be established on a periodic (e.g., annual) basis. We recommend that the Commission develop a generic cost of capital estimate for cable companies at regular (e.g., annual) intervals. This recommendation should include a central value and an acceptable range around the value. Companies could seek to justify the returns above the central value but within the range (and intervenors could seek to justify returns below the central value but within the range) based on documented deviations of risk from the norm.

The Commission also could consider establishing not only a recommended rate-of-return but also an acceptable rate-of-return range centered on the recommended value. Endorsing a range would permit a limited amount of discretion in setting rates of return for individual cable systems. Systems that were "high risk" could be awarded allowed returns near the upper end of the acceptable range while "low risk" systems could be awarded returns near the lower end of the range. Higher risk systems could include, for example, those that have relatively high debt service costs, those that have high physical system costs (e.g., fiber, underground cable, etc.), and those whose penetration is below average. As part of each annual rate of return setting exercise, the Commission might establish guidelines for setting rates for individual cable companies above or below the recommended value but within the recommended range.

The Commission should establish minimum pre-tax interest coverage standards[1] for cable systems where required returns would be adjusted upward, if necessary, until

---

[1]The pre-tax interest coverage ratio is defined as operating income before income tax plus net interest expense as a ratio to net interest expense.

a minimum acceptable coverage ratio was attained.[2] If the recommended rate of return value fails to generate revenues that provide the minimum acceptable coverage ratio, then the revenue requirements for cable system would be increased until minimum acceptable coverage was attained.

Conventional Rate Of Return Determination

Rates (prices) for service are set so that the required revenues will be generated if the anticipated sales volume is realized. In turn, these required revenues will produce the required return on the ratebase if costs are controlled to anticipated amounts. Conventional rate of return analysis first determines the after-tax required return on common equity, converts this return to its pre-tax equivalent, and then calculates an overall pre-tax cost of capital for debt and equity combined.[3]

The after-tax required return on common equity (ATRCEQ) typically is determined by a financial analyst utilizing one or more of the generally accepted analytical methods. The pre-tax rate of return on common equity (PTRCEQ) is calculated as the after-tax return (ATRCEQ) divided by one minus the effective federal, state, and local corporate income tax rate (RTX) or:

PTRCEQ = ATRCEQ / (1 - RTX).

The effective debt cost rate (DCR) for the regulated company also must be determined. This can be accomplished by calculating the current debt cost rate or the expected debt cost rate for a future year. The latter approach requires anticipating

---

[2]The bond rating agencies, such as S&P and Moody's, have set minimum acceptable pre-tax interest coverage standards for a company's debt offerings to be classified as investment grade. For telephone companies, the minimum pre-tax interest cover is approximately 2.3.

[3]The capital structure also can contain preferred stock and minority interest. If these other asset claims are present, the overall pre-tax cost of capital also includes their costs.

retirements and refinancing and projecting future interest rates. The pre-tax and post-tax debt cost rate is the same because interest expenses are tax deductible.

Finally, the capital structure of the regulated company must be calculated (i.e., the percentage of debt and equity capital must be determined). If the regulated company has an unusual capital structure (or if the companies comprising the regulated industry have a wide range of capital structures), a hypothetical capital structure can be used to calculate the overall pre-tax cost of capital for the regulated company. Defining the equity share of total capital as SEQ, the overall pre-tax cost of capital (PTRCAP) is calculated as follows:

$$PTRCAP = SEQ \times PTRCEQ + (1 - SEQ) \times DCR$$

An alternative to the conventional approach would be to directly estimate the pre-tax overall cost of capital (rate of return) based on the pre-tax overall returns of "comparable" groups of companies. Such an approach would be particularly beneficial if the capital structure of the companies in the regulated industry were very diverse. If the capital structures are diverse, the cost of common equity would vary substantially among companies within the industry. A company with a high equity share of total capital would tend to have a lower cost of common equity then would a company with a low equity share. Low equity share companies are highly leveraged making the return to equity very financially risky. As a result, the market demands a high return to supply equity capital to such a highly leveraged company. Conversely, a high equity share implies a much lower financial risk to the equity return. Therefore, the market would supply this equity capital at a much lower rate than it would to the highly leveraged company.

The total cost of capital to a company may be relatively constant for significantly different capital structures (i.e., as leverage increases, the rising market price for equity capital approximately offsets the reduction in capital costs stemming from giving a greater weight to lower cost debt). Modigliani and Miller (M-M) put forth a proposition in a famous paper that "the average cost of capital to any firm is completely independent of

its capital structure and is equal to the capitalization rate of a pure equity stream of its class."[4] Subsequent research regarding the proposition has raised serious questions. On the theoretical side, introducing the effect of corporate taxes into the analysis can lead to the conclusion that 100 percent debt provides the least expensive capital. However, introducing personal and corporate income taxes together supports the M-M proposition. On the empirical side, the results are inconclusive.

If the overall cost of capital is not strongly affected by the capital structure (i.e., M-M are at least partially correct), then direct estimation of the overall cost of capital for an industry consisting of firms with a diverse capital structure should be more tractable than the conventional approach.

Methods Used To Determine The Cost Of Common Equity

In a conventional rate of return determination, the required return on (cost of) common equity typically is estimated using a number of different analytical methods. The analytical methods most commonly employed include:

- Risk Premium Analysis;
- Discounted Cash Flow (DCF) Model;
- Capital Asset Pricing Model (CAPM);[5] and
- Comparable Earnings Analysis.

Risk premium analysis typically estimates the cost of equity capital by averaging the historic spread between the return on common equity return and the long-term debt cost rate or for the market as a whole. Adding this average historic spread to the expected long-term debt cost (rate) for the regulated company produces an estimate of

---

[4]Modigliani F. and M.H. Miller, "The Cost of Capital, Corporate Finance, and the Theory of Investment," American Economic Review, June 1958, p. 268.

[5]In a few jurisdictions (e.g., New York), extensions to CAPM also are being considered including the Arbitrage Pricing Theory (APT) Model and the Fama-French (F-F) Model.

the projected cost of common equity to the regulated company. In the typical application of the risk premium, the average historic spread is used as an estimate of expected future spread. CAPM also can be viewed as a method for estimating the expected future spread.[6]

The two model based methods (DCF and CAPM) can be applied directly to the data for the regulated company, to the data for a group of "comparable" companies, or to both the company and the "comparable" group data. In financial analysis, "comparable" is used to mean similar but not identical. The similarity can be in terms of markets served (e.g., other companies that compete for the same consumer dollars) and/or in terms of companies that are perceived by investors to have similar earnings potential and risk (e.g., other high growth stocks, other "high tech" companies' stocks, and other stocks with similar risk as indicated by the CAPM beta measure).

The DCF and CAPM model based approaches have been subject to substantial recent criticism.[7] The alternative approaches suggested include moving to more sophisticated modeling methods such as the APT and Fama-French approaches, but the older comparable earnings approach also has been promoted.[8] One of the key criticisms of the "comparable" earnings approach has been that by selecting an "appropriate" comparable group, a financial analyst can obtain an a priori desired result, but this criticism is eliminated if the "comparable" group or groups are specified by the regulatory body. We propose that the Commission specify several comparable groups that include companies with similar risk and also industries that compete with the cable

---

[6]The APT and F-F models also can be viewed this way.

[7]See for example Whitaker, Win, "The Discounted Cash Flow Methodology: Its Use in Estimating A Utility's Cost of Equity", Energy Law Journal, Vol. 12, 1991, pp. 265-290 (hereinafter Whitaker, Energy Law Journal); Fama, Eugene F., 1991, "Efficient Capital Markets: II, "Journal of Finance, 46, 1575-1617", and Fama, Eugene F. and Kenneth R. French, 1992, "The Cross Section of Expected Stock Returns", Journal of Finance, 47, 427-465.

[8]Whitaker, Energy Law Journal.

television industry for the consumers' dollar. The specific companies to be included in the "comparable" group need not be listed, but specific criteria for selection must be identified. For example, if telephone companies were specified to be one of the "comparable" groups to be examined, the selection criteria could be all telephone companies considered by Value Line. If a subset of the S&P Industrials was to be selected, then the selection criteria could be all companies with risk measures as reported by Value Line that fall within a given range of the same risk measures reported by Value Line for all cable companies.

The comparable earnings analysis is derived from the "corresponding risk" standard of the landmark cases of the U.S. Supreme Court. Thus, comparable earnings is consistent with the Hope doctrine that the return to the equity owner should be commensurate with returns on investments in other firms having corresponding risks.

The comparable earnings method is based on the opportunity cost principle which maintains that the true cost of an investment is equal to the cost of the best available alternative use of the funds to be invested. The opportunity cost principle is consistent with one of the fundamental principles upon which regulation rests - that it is intended to act as a surrogate for competition and to provide a fair rate of return to investors.

The comparable earnings method is designed to measure the returns expected to be earned on the book common equity, in this case net worth, of similar risk enterprises. Thus, it provides a direct measure of return, since it translates the competitive principles upon which regulation rests into practice. Under the comparable earnings approach, the historical and expected future earnings rates for a "comparable" group of companies are used directly to produce an estimate of the required return for the regulated company. If several satisfactory "comparable" groups of companies can be identified, then the historical and expected future earnings of the several groups can be evaluated and combined to form an expected (recommended) return rate for the regulated company. Further, the range of estimates produced by the several "comparable" groups can be used to establish an acceptable range centered on the recommended value.

Use of several "comparable" groups has the advantage of making the result not wholly dependent on the economic fortunes of a given type of company (e.g., telephone companies) or to companies serving the same market (e.g., companies serving the recreation and leisure markets). Therefore, if a "comparable" earnings approach is taken, a more stable and reasonable result should be obtained if several "comparable" groups are evaluated. In such a circumstance, the recommended return would combine (be an average of) the results produced by analyzing the separate groups. The variation in results produced across "comparable" groups could be used to define an acceptable range centered on the recommended value.

A comparable earnings approach need not rely solely on historical earnings performance of the companies in the "comparable" group. If the companies or the groups are limited to those that are analyzed by a service like Value Line, then the analysis can consider both the historical earnings performance (e.g., average over the last 5 years) as well as the expected future earnings performance as anticipated by the Value Line analysts.[9] Relying on a source like Value Line for the expected future earnings forecast has the advantage of simplicity (i.e., no independent modeling effort need be done) and of neutrality.

The comparable earnings approach can be used to determine the pre-tax overall cost of capital as well as the after-tax cost of common equity. The same set of comparable groups of companies can be used to produce estimates of both capital cost measures. Finally, if the companies in the groups are limited to those considered by Value Line, the estimates of both capital cost measures can take into account both historical averages and analyst forecasts.

The energy utilities in New York State in conjunction with the Staff of the New York Public Service Commission recently have performed an enormous amount of research

---

[9]See David A. Gordon, Myron J. Gordon, and Lawrence I. Gould, "Choice Among Methods of Estimating Share Yield," Journal of Portfolio Management, Spring 1989, pp. 50-55.

into alternative approaches to determining the cost of common equity and have recently released a study presenting their findings.[10] This work was done as part of a now two-year long effort (beginning in August 1991) to evaluate the DCF approach that has been embraced by the New York Commission for many years (the retention growth DCF model applied to the regulated company's data). Also, a wide range of alternatives was tested. These analyses considered the DCF, CAPM, APT, Fama-French, Comparable Earnings, and other approaches. Key conclusions of the study were to reject sole reliance on the DCF method, to combine multiple estimates of the cost of equity capital, and to rely on analyses of data for proxy or barometer group companies instead of the data for any single company.[11]

The Capital Structure of Cable Companies is Very Diverse

As shown in the table below, the capital structures for cable companies are extremely diverse. Equity as a percentage of total assets ranges from a high of 60 percent to a low of -100 percent.[12] Of the 12 companies listed in the table, five have negative equity. The range of positive equity shares is 60 percent to 18 percent. Therefore, even without the negative equity cases, the capital structures of companies in the cable television industry is highly diverse.

---

[10]Return on Equity Consensus Document, prepared by the signatory remarks of the Electric and Gas Industry Group, Case 91-M-0509, June 2, 1993 (hereinafter the Consensus Document).

[11]Consensus Document, p. 3.

[12]Negative equity results from a very substantial accumulated deficit. Losses since system acquisition have eliminated the initial positive equity positions for these systems.

SELECTED CABLE COMPANY EQUITY TO ASSET RATIOS				
		Equity (Mil $)	Total Assets (Mil $)	Equity/Asst Ratio (Percent)
Jones Intercable Investors, L.P.	12/31/92	$31.5	$52.6	59.8
Knight Ridder	12/27/92	$1,181.8	$2,458.1	48.1
Liberty Media 1/	12/31/92	$365.7	$808.9	45.2
Times Mirror Company	12/31/92	$1,700.6	$4,327.3	39.3
Tele-Communications, Inc.	12/31/92	$1,486.0	$4,681.0	31.7
TCA Cable TV, Inc.	10/31/92	$78.0	$289.9	26.9
Viacom International, Inc.	12/31/92	$765.5	$4,317.1	17.5
Comcast Corporation	12/31/92	($181.6)	$4,271.9	-4.3
Century Communications Corp.	5/31/92	($178.3)	$1,358.0	-13.1
Continental Cablevision, Inc.	12/31/92	($1,486.2)	$2,003.2	-74.2
Adelphia Communications Corp.	5/31/93	($868.6)	$949.6	-91.5
Cablevision Systems Corp.	12/31/92	($1,250.2)	$1,251.2	-99.9

1/ Equity includes a small amount of preferred stock.
Source: Published company financial statements.

This capital structure diversity implies that a hypothetical capital structure should be employed if the conventional approach of first estimating after-tax cost of common equity is employed. Given the equity percentage diversity in the table, a hypothetical capital structure employing 50 percent equity and 50 percent debt is reasonable (the Commission may have anticipated this result in the NPRM at ¶52). Alternatively, the issue of defining a hypothetical capital structure could be eliminated by electing to directly estimate the pre-tax overall cost of capital.

Recommended Methodologies to Determine the Cost of Capital for Cable Systems

We recommend that the FCC consider two parallel approaches to estimating the cost of capital for cable systems: (1) direct estimation of the pre-tax overall cost of capital; and (2) estimation of the after-tax cost of common equity and then using a hypothetical 50/50 capital structure to estimate the pre-tax overall cost of capital.[13] We believe that the pre-tax overall cost of capital approach is simpler to apply in that it requires fewer assumptions (e.g., no corporate tax rate, no hypothetical capital structure, and no debt cost rate need be assumed or estimated). The pre-tax overall cost of capital approach has been used as a check for estimates generated using the more conventional after-tax cost of common equity based approaches. However, we believe that the Commission will see the advantages of the pre-tax overall cost of capital approach as a result of the parallel application of this new approach and the conventional after-tax return on common equity approach to the proxy groups selected for cable systems.

The recommended method for estimating both the pre-tax overall cost of capital and the after-tax cost of common equity is the comparable earnings approach. The comparable earnings approach recommended here is a much more constrained technique than the generic comparable earnings approach. We believe that the Commission, if it adopts the comparable earnings approach, must specify the comparable

---

[13]To estimate the pre-tax overall cost of capital, an effective corporate income tax rate will have to be determined (e.g., 40 percent) and the debt cost rate will have to be estimated. The average percent debt costs for cable companies could be used or the average debt cost rate for a proxy group of companies could be used.

groups to be used and also how the comparable earnings calculations are to be done. We have specific recommendations regarding both how the comparable groups should be defined for cable systems and also how the calculations should be done.

We have identified four candidate comparable groups for cable systems; namely:

- A sample of 70 companies from the S&P Industrials that have measure characteristics similar to those of the cable companies;

- Broadcasting companies;

- Telecommunications companies; and

- Recreation and leisure industry (entertainment) companies.

The companies considered for inclusion in these groups have been limited to those that are covered by the Value Line service. Value Line has the broadest coverage of any of the competing services. Value Line does not cover some of the smaller lightly traded companies. Restricting the list of companies that can potentially enter the comparable groups to those covered by Value Line provides ready access to published data that can be used to compute historical and forecast estimates of both the pre-tax overall rate of return and the after-tax rate of return on common equity. The recommended estimate for capital costs is a simple average of historical average cost and the projected future cost (both of which appear in Value Line).

Analysis of the Financial Characteristics of Five Large Cable Companies

Value Line reports on five cable television companies.[14] Exhibit 1 provides various financial statistics taken from Value Line and Compustat. As shown on the first page of Exhibit 1, the average of Value Line's adjusted CAPM betas for these five companies is 1.30, indicating that stocks are more volatile (risky) than the returns from a "typical" stock. If a company's stock is perceived as being of average risk, then its adjusted beta will equal approximately 1.0. The average beta for the S&P Industrials is close to 1.0.

The average cost of debt for the five Value Line cable companies over the last five years is 11.0 percent and, for 1992, is 8.5 percent (see page 2 of Exhibit 1). The average of the pre-tax overall rate of return over the last five years has been 14.0 percent reflecting, in part, the continuing U.S. recovery. This return is expected by Value Line analysts to increase to 21.4 percent over the next five years (see page 3 of Exhibit 1). This strong recovery assumes a recovery from the current recession. The expected future return for most industry groups is higher than the recent historical average returns due to the expected recovery from the prolonged recession. The simple average of the historical and forecast pre-tax overall rate of return is 17.7 percent ((14.0 + 17.7) ÷ 2). After-tax returns on equity are not reported because the negative equity position of several of these companies renders the after-tax rate of return on equity calculations meaningless.

Defining the Comparable Groups

S&P Industrial Subset

The first comparable group consists of 70 of the S&P Industrial companies selected because the risk measures, as reported by Value Line, are similar to those for the five cable companies (see Exhibit 2). The two risk measures used are the Value Line beta

---

[14]These companies are Cablevision, Comcast, Multimedia, TeleCommunications, and Viacom. Value Line classifies companies according to their primary line of business. As a result, Time-Warner and Gaylord are in Value Line's recreation and leisure industry groups.

(a measure of the systematic risk) and the residual standard deviation from the regression used by <u>Value Line</u> to calculate its beta (a measure of unique or unsystematic risk).

These two risk measures are derived from the capital asset pricing model (CAPM). CAPM is expressed as follows:

$$R_{it} = \alpha_i + B_i R_{mt} + \epsilon_{it}$$

where:

R_{it} = The return on security i (or the group of securities i) during period t;

R_{mt} = The return on a broad stock market index (e.g., all New York Stock Exchange or the S&P Industrial stocks) during period t;

α_i = Alpha, which is the constant or intercept term, and is interpreted as the expected return on security i when R_{mt} equals zero;

B_i = Beta, or the slope coefficient, which indicates the relationship between fluctuations in the returns on security i and the overall market returns (R_{mt}). If B_i equals 1, then the returns on security i have the same volatility (business risk) as do the market returns. If B_i is less than 1, then the returns to security i are less volatile (less risky) than the returns for a typical stock. If B_i is greater than 1, then the returns to security i are more volatile (have a greater business risk) than the returns from a broad portfolio of stocks. B_i is a measure of the systematic risk of security i in that it is the risk common to all stocks and, therefore, cannot be diversified away.

ϵ_{it} = The residual error term for security i in period t. This term measures the unique or unsystematic risk associated with the returns to security i which, according to CAPM theory, can be diversified away.

The total risk to the returns to security i can be expressed as follows:

Total Risk of Security i = Market (Systematic) Risk to the Returns on Security i
+ Specific (Unique or Unsystematic) Risk to the Return on Security i

or

$$\sigma_i^2 = B_i^2 \sigma_m^2 + \sigma^2(\epsilon_i)$$

where:

$\sigma_i^2 =$ Total risk (variance) of security i;

$\sigma_m^2 =$ Risk (variance) of the market return;

$B_i =$ The CAPM beta of security i which measures the sensitivity of R_{it} to R_{mt};

$B_i^2 \sigma_m^2 =$ The market (systematic) risk to the return on security i; and

$\sigma^2(\epsilon_i) =$ Risk (variance) that is unique (specific or unsystematic) to the returns on security i which is also referred to as the diversifiable risk.

CAPM theory provides two measures of relative risk. The systematic risk for a stock can be characterized by its beta because the systematic risk to the returns of a given security is proportional to the given security's beta. The unique (or unsystematic) risk of a given security is characterized by the residual standard deviation of the regression linking its return (R_{it}) to the market return (R_{mt}) or by $\sigma(\epsilon_i)$. The greater a given security's residual standard deviation, the greater effect events specific to a given

company's operations have on its returns. Value Line provides estimates of beta (β_i) and the standard error of the regression ($\sigma(\epsilon_i)$) for every stock that it covers.

In essence, companies which have similar betas and residual standard deviations have similar investment risk (i.e., the sum of systematic (market) risk and unsystematic (business and financial) risk). Page 1 of Exhibit 1 shows the betas estimated from the above CAPM regression equation (the "unadjusted betas" column) and the standard error ($\sigma(\epsilon_i)$) from the regression (the "residual standard deviation" column) for the five cable companies covered by Value Line.

The average unadjusted beta for the five Value Line cable companies is 1.41. The three standard deviation range around 1.41 is 0.98 to 1.84. The residual standard deviation average is 4.1492 and the range around it is from 3.6033 to 4.6951.[15] Of the almost 400 S&P Industrials, 70 companies fall within these two risk measures. Exhibit 2 presents financial statistics for these 70 S&P Industrial companies including the two cost of capital estimates.

Telecommunications Group

The telecommunications industry currently competes with the cable television industry and its competition is expected to intensify. The telecommunications industry is much less risky than cable television companies for many reasons. First, tele-communications companies have essentially 100 percent of the market in the areas served while the cable television companies typically have a much lower percentage. Telephone companies also are much larger than the typical cable company implying that the market will assign a higher risk to the earnings of the cable companies. Telephone

---

[15]This range is defined based on the standard error for the mean return over the estimation period. The standard error for the mean return equals the residual standard deviation divided by the square root of the sample size used by Value Line to estimate its betas. Value Line uses five years of weekly data to estimate its betas for a sample size of 520. The standard error for the mean return of the cable company securities is therefore 0.181954 (4.1492 ÷ 22.804). The range is defined as plus or minus 3 times 0.181954.

---

companies also are old established firms with a long track record of profitability while the cable industry is relatively new and has no track record of profitability. Telephone companies offer a service which is viewed as a virtual necessity with no direct competition (i.e., local loop telephone service) while cable television provides a discretionary service in competition with the services provided by a broad array of entertainment industry companies (movies, television, radio, video retailers, video games, publishers, etc.).

Two telecommunications comparable groups were evaluated: (1) all telephone companies considered by Value Line; and (2) the seven Regional Bell Holding Companies and the five largest independents. The second group is the preferred group because it is expected to be stable over time. Exhibit 3 presents the financial statistics for this group including the two cost of capital estimates.

Broadcast Group

The broadcast group includes both the network and local television stations. Both types of companies are in close competition with cable television companies. The Value Line broadcast group contains only five companies. Exhibit 4 presents the financial statistics for these companies including the two cost of capital estimates.

Recreation Group

Value Line defines a recreation group that includes all companies that supply products and services related to recreation. The industries included are:

- Motor boat manufacturers;
- Motorcycle manufacturers;
- Game and toy manufacturers;
- Movie and TV production companies;
- Publishing companies;
- Movie theaters;
- Resorts;
- Cruises; and

• Two companies that have major cable operations (Time-Warner and Gaylord).

All the companies contained in this Value Line group are identified on the first three pages of Exhibit 5.

The second recreation group defined in Exhibit 5 excludes Time-Warner and Gaylord as do the two subsequently defined subgroups. (The travel subgroup excludes the motor boat and motorcycle manufacturers.) The first recreation subgroup (the third group defined in Exhibit 5) (i.e., it includes home and local leisure companies and vacation/resort companies).[16] The second recreation subgroup (the fourth grouping is defined in Exhibit 5) focuses on home and local leisure services and products and excludes resorts and cruises. The first subgroup (movie, local leisure, and vacation/resort services) constitutes our preferred choice to represent the entertainment companies that are most closely competitive with cable television for the consumers' entertainment dollar. The second subgroup is defined as the alternate choice for the recreation group. It includes all the companies in the recreation group except Time-Warner and Gaylord. Exhibit 5 provides financial statistics for the four recreation company groupings.

Estimates of the Cost of Capital for the Cable Systems

Exhibit 6 summarizes the results obtained by analyzing all the comparable groups and subgroups. This exhibit also presents the results for the five cable television companies (see Exhibit 1). The cable television companies have the highest adjusted beta. The adjusted beta for the S&P 70 comparable group is closest to that of the cable companies.

Exhibit 6 also presents a summary of the financial results for two sets of comparable groups: (1) the preferred set; and (2) the alternate set. The S&P 70 group

---

[16]A book publisher also is included within this group.

---

and the broadcast group are included in the preferred and alternate sets. In the preferred set, the telecommunications group is made up of the 7 RBHCs and the five large independent telcos. Some of the smaller telecommunications companies have quite different characteristics than the large companies. In the alternate set, all the Value Line telecommunications companies are included in the telecommunications group. The recreation industry companies comprise the final group. In the preferred set, the recreation group consists of home and local leisure products and services plus vacation/resort products and services (Time-Warner and Gaylord are excluded due to their substantial cable telecommunications activities). This subset of the Value Line recreation industries competes most directly with the cable systems. The alternate set defines the recreation group as all companies included by Value Line except Time-Warner and Gaylord.

The following two tables present estimates of the after-tax cost of common equity and the pre-tax overall cost of capital, respectively, for cable television systems derived from the data for the comparable groups. In each table, the results generated using both the preferred and alternate sets are presented. To put these two sets of results on a comparable basis, the after-tax cost of common equity estimates must be converted to a pre-tax overall cost of capital estimate. To do this, debt cost rate estimates are needed. The average 1992 debt cost rates for the comparable groups in the two sets are used (see the third table below).

The next table presents a comparison of the results. The pre-tax overall cost of capital generated using the conventional cost of common equity approach is lower for both the preferred and alternate sets. The last table calculates an "acceptable" range of estimates for the pre-tax overall cost of capital generated by the two methods for the two sets of comparable groups. The range is defined as plus and minus one standard deviation around the recommended value.

The two analytical approaches applied to the two sets of comparable groups produce a fairly wide range of pre-tax overall cost of capital estimates. If the two results

are combined (averaged), the following composite estimate of the pre-tax overall cost of capital for cable systems is obtained:

**PRE-TAX OVERALL COST OF CAPITAL
FOR CABLE TELEVISION SYSTEMS**

<u>Low</u>	<u>Recommended</u>	<u>High</u>
17.3	18.9	20.5

The above estimates are based, in part, on average debt cost rates for 1992. If the average debt cost rate for the last several months was used instead, these calculations would yield somewhat lower results.[17]

In summary, the recommended approach for estimating the pre-tax overall cost of capital for cable television systems involves:

1. Defining the four types of comparable groups.

    a. Subset of S&P Industrials that have <u>Value Line</u> risk measures similar to those <u>Value Line</u> produces for the cable television companies.

    b. The Broadcast Group which includes all companies classified by <u>Value Line</u> to be in the Broadcast industry.

    c. The two telecommunications groups are:

        1) Preferred: The seven RBHCs and the five major independents.

        2) Alternate: All companies classified by <u>Value Line</u> to be in the telecommunications industry.

---

[17]Such an update would reduce the pre-tax overall capital cost rate recommendations presented above by 25 to 50 basis points.